

1. (Amended) A physical vapor deposition target comprising a material with a face centered cubic unit cell, having a sputtering surface, and formed by a process comprising:

casting;

aging; and

equal channel angular extrusion; the target having a predominate <220> crystallographic texture across the sputtering surface; and an average grain size across the sputtering surface of less than or equal to about 30 microns.

2. The physical vapor deposition target of claim 1 wherein the average grain size across the sputtering surface is less than or equal to 1 micron.

3. The physical vapor deposition target of claim 1 further comprising substantially no pores or voids proximate the sputtering surface.

4. The physical vapor deposition target of claim 1 wherein the predominate <220> crystallographic texture is a strong <220> crystallographic texture.

5. The physical vapor deposition target of claim 1 comprising a ratio of the <220> crystallographic orientation to all other orientations of the face centered cubic unit cell of at least about 80%.

6. The physical vapor deposition target of claim 1 comprising a ratio of the <220> crystallographic orientation to all other orientations of the face centered cubic unit cell of at least about 90%.

7. The physical vapor deposition target of claim 1 wherein substantially all of the grain sizes across the sputtering surface are less than about 30 microns.

8. The physical vapor deposition target of claim 1 wherein substantially all of the grain sizes across the sputtering surface are less than 1 micron.

9. The physical vapor deposition target of claim 1 wherein the <220> texture comprises predominately axial <220> orientations.

10. The physical vapor deposition target of claim 1 wherein the <220> texture comprises predominately planar <220> orientations.

11. (Amended) The physical vapor deposition target of claim 1 comprising at least one element selected from the group consisting of aluminum, copper, silver, gold, nickel, brass, cerium, cobalt, calcium, iron, lead, palladium, platinum, rhodium, strontium, ytterbium, and thorium.

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12. (Amended) The physical vapor deposition target of claim 1 comprising at least one element selected from the group consisting of aluminum, copper, gold, nickel, and platinum.

13. The physical vapor deposition target of claim 1 wherein any precipitates present in the target have a maximum dimension of 0.5 micron.

67. (Amended) A physical vapor deposition target comprising a copper material with a face centered cubic unit cell, having a sputtering surface, and comprising: a predominate <220> crystallographic texture across the sputtering surface; and an average grain size across the sputtering surface of less than or equal to about 30 microns, wherein any precipitates present in the target have a maximum dimension of 0.5 micron, the material being formed by a process including casting.

68. (Amended) The physical vapor deposition target of claim 67 further comprising at least one element selected from the group consisting of aluminum, silver, and gold.

69. The physical vapor deposition target of claim 68 comprising aluminum.

70. The physical vapor deposition target of claim 68 comprising silver.

71. The physical vapor deposition target of claim 68 comprising gold.

72. The physical vapor deposition target of claim 67 wherein the average grain size across the sputtering surface is less than or equal to 1 micron.

73. The physical vapor deposition target of claim 67 further comprising substantially no pores or voids proximate the sputtering surface.

74. The physical vapor deposition target of claim 67 wherein the predominate <220> crystallographic texture is a strong <220> crystallographic texture.

75. The physical vapor deposition target of claim 67 comprising a ratio of the <220> crystallographic orientation to all other orientations of the face centered cubic unit cell of at least about 80%.

76. The physical vapor deposition target of claim 67 comprising a ratio of the <220> crystallographic orientation to all other orientations of the face centered cubic unit cell of at least about 90%.

77. The physical vapor deposition target of claim 67 wherein substantially all of the grain sizes across the sputtering surface are less than about 30 microns.

78. The physical vapor deposition target of claim 67 wherein substantially all of the grain sizes across the sputtering surface are less than 1 micron.

79. The physical vapor deposition target of claim 67 wherein the <220> texture comprises predominately axial <220> orientations.

80. The physical vapor deposition target of claim 67 wherein the <220> texture comprises predominately planar <220> orientations.

82. (Cancelled)

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